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Binder 027, Bucephalidae Prosorhynchus [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

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16. *Prosorhynchus kabala* n. sp. Yam., 1970
(Fig. 16)

HABITAT: Intestine of *Seriola dumerilii* (local name "kahala"); Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63541.

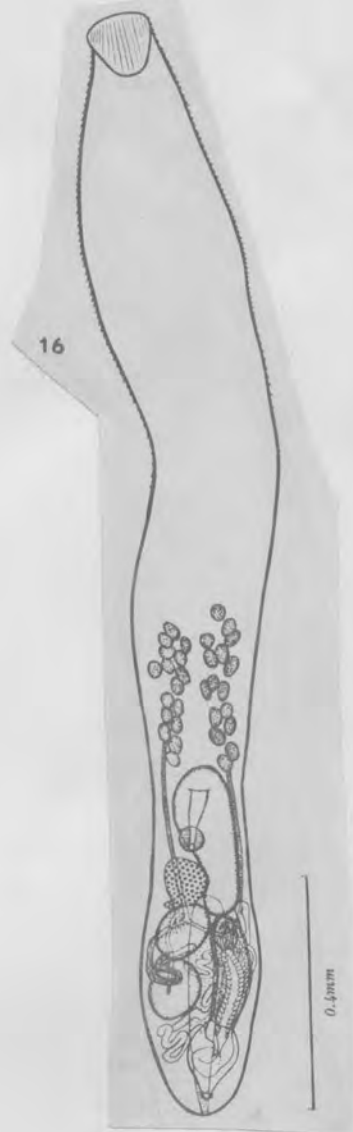
DESCRIPTION (based on eight whole mounts): Body slender, flattened subcylindrical, 0.95-1.9 mm long, 0.1-0.2 mm wide. Cuticle very thin and delicate, with minute evanescent spines anteriorly. Rhynchus shaped like a massive plug, muscular, $50-100 \times 50-110 \mu$. Pharynx $25-46 \times 21-46 \mu$, situated just in front of ovary, a little anterior to middle of caudal third of body. Esophagus $20-65 \mu$ long, directed forward from pharynx; intestine $0.11-0.22$ mm long, turning backward at beginning and reaching as far as base of cirrus pouch, a short distance back of pharynx.

Testes ovoid, $35-111 \times 23-105 \mu$, directly tandem or partly overlapping each other alongside cirrus pouch. Cirrus pouch subcylindrical, $105-220 \times 25-63 \mu$; seminal vesicle oval, $46-60 \times 16-40 \mu$; prostatic complex well

developed; genital lobe curved, occupying nearly whole genital atrium, without particular projection. Genital atrium $23-93 \mu$ wide, funnel-shaped posteriorly and opening ventrosubterminally.

Ovary intercalated between pharynx and anterior testis in the type, may overlap pharynx, with shell gland dextroposteriorly. Laurer's canal opening dextrodorsally at level of posterior testis. Uterus running from right dorsal side of testes to left side dorsal to cirrus pouch, then descending to right of genital atrium. In the type the uterus contains many small abnormal eggs in addition to few normal ones; it extends a little anterior to base of cirrus pouch, sometimes may reach to the pharynx. Eggs oval, $14-18 \times 9-12 \mu$. Vitelline follicles 11-13 on each side, totalling 24-29, arranged in two nearly parallel rows immediately anterior to intestine; largely at junction of middle with posterior third of body; right vitelline duct descending dorsal to ovary; left vitelline duct traversing dorsal to anterior portion of cirrus pouch; two ducts joining together dorsal to anterior end of anterior testis. Excretory vesicle reaching to level of posterior end of ovary, with terminal pore.

DISCUSSION: This species differs from the most closely related *Prosorhynchus longicollis* Yamaguti, 1953 from *Sphyræna* sp. of Macassar in the esophagus being directed forward instead of backward, in the vitellaria not extending back of the pharynx, and in the eggs being slightly smaller ($14-18 \times 9-12 \mu$ vs. $18-21 \times 12 \mu$). The specific name refers to the local name of the host.



Habitat. Small intestine of *Sphyaena* sp.

Material and locality. Two whole mounts; Macassar.

Body slender, fragile, with long neck region, 1.5–2.2 mm in length, with maximum breadth of 0.21–0.25 mm at posterior third. Cuticle thin, beset with minute evanescent spines. Of the subcuticular muscles the longitudinal and diagonal fibers are well developed in the long neck region. Rhynchus plug-shaped, not very muscular, 100–105 μ long by 95 μ broad. Pharynx 75–80 \times 90–96 μ , situated at junction of middle with posterior third of body or a little more posteriorly. Esophagus 25 μ wide, curved, consisting mainly of longitudinal muscle fibers. Intestine saccular, voluminous, 0.16–0.18 mm in diameter, directed backward, reaching to ovary and anterior testis, separated from cirrus pouch by uterine loop.

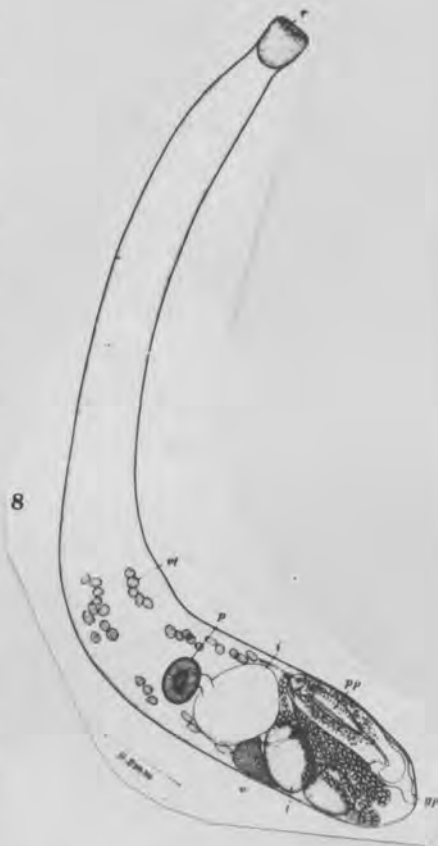
Testes ovoid, 65–100 \times 105–160 μ , situated on the right, one directly behind the other; anterior testis at middle of posterior third of body or a little more posteriorly with its anterior end in contact with intestine. Cirrus pouch subcylindrical, 0.21–0.27 mm long by 75–90 μ broad, consisting of longitudinal muscle fibers

extending on the left to level of anterior testis or ovary. Vesicula seminalis somewhat winding, pars prostatica and prostate cells well developed, cirrus narrow. Genital lobe filling up almost entire genital atrium, with accessory lobe near opening of cirrus, provided at base with well developed circular muscle fibers, which constrict off the genital lobe from the cirrus pouch. Genital atrium 65–75 μ in diameter, opening at extreme posterior end of body in the type, but 35 μ in front of it ventrally in the paratype, by a wide funnel-shaped duct provided with inner longitudinal and outer circular muscles.

Ovary subglobular or rounded triangular, 65–80 μ in greater diameter, immediately anterodextral to anterior testis in contact with posterior end of intestine. Shell gland complex dorsal or dorsodextral to anterior testis. Uterus extending between testes and cirrus pouch as well as behind posterior testis, forming a loop in the narrow space between the intestine and the anterior end of the cirrus pouch. Eggs oval, thin-shelled, 18–21 \times 12 μ . Vitelline follicles oval, divided into two lateral series, 14–16 on each side, each series commencing a short distance behind middle of body and terminating at level of intestine. The right vitelline duct passes down dorsal to the ovary, while the left one, running down along the left side of the intestine and then between the cirrus pouch and the intestine dorsal to the uterus, turns forward at right angles to join its fellow dorsal to the anterior testis near its anterior end; the common duct runs obliquely backward at right angles to the right and left vitelline ducts which are on the same line, and unites with the germiduct dorsal to the anterior testis.

Excretory pore dorsal, 18 μ in front of terminal genital pore in the type; extent of vesicle not determined.

This species is characterized by the possession of a very long neck, to which the specific name refers. In this respect it bears a certain resemblance to *Prosorhynchus freitasi* Nagaty, 1937, but differs from this in the intestine being directed backward instead of forward, and in the reproductive organs being confined to the posterior quarter of the body.



17. *Prosorhynchus longicollis* Yamaguti, 1953

Yam, 1970

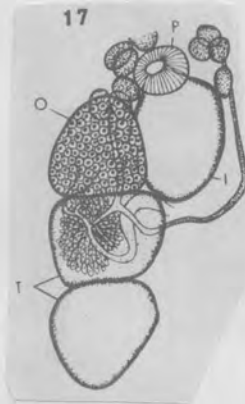
(Fig. 17)

HABITAT: Small intestine of *Sphyræna barracuda* (local name "kaku"); Hawaii.

DESCRIPTION (based on a single mount): Body 1.54 mm long, 0.37 mm wide at testicular zone. Long neck region strongly contracted, so that the position of the pharynx, ovary, and testes is quite different from that in the type specimen which is well extended, especially in the neck region. Rhynchus triangular in ventral view, 0.15×0.19 mm. Pharynx $80 \times 110 \mu$, equatorial. Intestine directed backward, 0.16 mm wide. Testes subglobular, 0.15×0.16 mm and 0.18×0.16 mm respectively, directly tandem on the right side in anterior part of posterior third of body. Genital atrium 0.18×0.13 mm, opening at posterior end of body. Ovary subglobular, 0.14×0.15 mm, immediately anterior to anterior testis, overlapping intestine laterally. Vitelline follicles 15 on the right, 14 on the left, in two longitudinal bunches, extending forward from pharyngeal level. Uterine coils largely in space between intestine and cirrus pouch and behind

posterior testis. Eggs oval, $18-21 \times 11-14 \mu$. Excretory pore dorsoterminal.

DISCUSSION: It is interesting to note that this species occurs in the related host fishes from so widely separated areas in the Pacific.



Durio & Manter, 1968

Prosorhynchus longisaccatus n. sp.

(Fig. 7)

Host: Serranidae; commonly called "leche."

Location: Intestine.

Number: Two from one host.

Holotype: USNM Helm. Coll. No. 63304.

Description: Body elongate, anterior end truncate, posterior end broadly rounded; length 1.096–1.201; almost uniformly wide; width 0.331–0.348. Rhynchus well developed, cone-shaped, with flattened top, 0.267–0.283 long by 0.267–0.271 wide at anterior end; anterior edge broadly indented ventrally. Muscles of rhynchus cone bilaterally arranged, with lateral transverse bands and two submedian, more or less diagonal or dorsoventral bands. Muscles of anterior edge of rhynchus more or less perpendicular to surface ventrally, but dorsally arranged in paired groups of diagonal muscles.

Mouth near midbody; pharynx 0.065–0.074 in diameter; cecum anterior to pharynx, short, wide, extending almost halfway between pharynx and rhynchus.

Testes ovoid, diagonal, close together; posterior testis to right of, or immediately posterior to, pharynx. Cirrus sac to left of midline, 0.477–0.552 long by 0.141–0.152 wide; thick-walled; extending to midlevel of posterior testis and to, or almost to, pharynx. Seminal vesicle tubular, extending about one-third length of cirrus sac, then bending directly forward as a sperm-free tube, joining pars prostatica near basal (proximal) end of cirrus sac; pars prostatica long, relatively narrow, with dorsoventral loop near middle of cirrus sac. Genital pore ventral, slightly to left of midline, near posterior end of body.

Ovary ovoid, to right of, or partly posterior to, anterior testis. Vitellaria in anterior third of body, mostly lateral, confluent at base of rhynchus; 13 follicles on each side; posterior follicles overlapping anterior part of cecum, not reaching testis. Mehlis' gland overlapping right posterior edge of ovary, or (in paratype) dorsal to left side of posterior testis. Uterus extending anteriorly along left side of cecum but not anterior to it, filling most of body to right of cirrus sac; not extending postatrially. Eggs 30–33 by 17–23 μ . Excretory pore terminal; vesicle along left side of atrium; anterior extent not determined.

The name *longisaccatus* refers to the long cirrus sac.

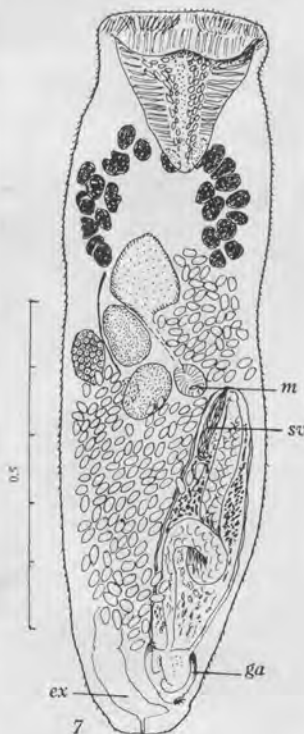
Discussion: This is one of those species of *Prosorhynchus* with cone-shaped rhynchus, vitellaria forming an arc and ovary not anterior to testes. It seems most closely related to *P. epinepheli* Yamaguti, 1939. A species we consider to be *P. epinepheli* was collected (34 specimens) from *Epinephelus merra* Bloch at Heron Island, Australia. It agrees with *P. longisaccatus* in that the gonads are clustered close together in the region of the pharynx and cecum. The ovary may be anterior to both testes, but usually it overlaps the anterior testis. Yamaguti's (1939) figure shows one testis rather widely separated from the other, but this character was not mentioned in his description. In the Australian material, the testes are close together or separated only by a single coil of the uterus. Two characters separate *P. longisaccatus* from *P. epinepheli*: (1) the uterus does not extend even to midatrial level, whereas in all specimens of *P. epinepheli* it extends postatrially; (2) the rhynchus is wider, and the arrangement of muscles at its anterior edge gives a distinctive appearance. The cirrus sac is thick-walled in both New Caledonian and Australian material.

Prosorhynchus longisaccatus is also similar to *P. crucibulus* (Rud.), especially *P. crucibulus japonicus* Yamaguti, 1958, but has fewer vitellaria, the testes closer together, and a larger cirrus sac.

In most species of *Prosorhynchus*, the ovary is anterior to the anterior testis but in several of them it more or less overlaps, or may be directly opposite, this testis. In all six named species of *Neidhartia*, the ovary is at a level

between the testes. At the present time, this difference seems to be the best character to separate the two genera.

Prosorhynchus longisaccatus occurred in the same host with *Myorhynchus pritchardae*.



Prosorhynchus longus nov. sp.

(Fig. 16)

Velasquez, 1959

Host: *Psettodes erumei* (Bloch and Schneider)

Location: stomach

Locality: Divisoria market, Manila, Philippines

Prevalence: 7 immature from 1 of 9 hosts examined

Type: U.S. Nat. Mus. Helm. Coll. No. 37691

Paratypes: University of the Philippines, Dept. of Zoology, Helm. Coll. No. 75d

Specific diagnosis: (Based on 5 immature specimens). Body relatively long, cylindrical, 0.58–1.64 by 0.196–0.24 with long neck; cuticular spines minute. Rhynchus weakly muscular, lenticular, plug-shaped, 0.1–0.12 by 0.12–0.14. Mouth at distal third of body, usually directed posteriorly, but anteriorly in some. Pharynx muscular, 0.043–0.06 by 0.044–0.047; oesophagus, 0.043 long; intestine, elongate, saccular, 0.47 long in one specimen. Gonads in posterior third of body. Testes tandem, globular; cirrus sac short, small about 1/10 body length, 0.24–0.34 by 0.04–0.09. Seminal vesicle subglobular; pars prostatica narrow; genital atrium widened; genital pore subterminal. Ovary approximately 1/3 diameter of testis. Vitellaria 26, arranged in 2 lateral rows, posterior to ovary; in 1 specimen grouped in midbody partly overlapping anterior and posterior testis (Fig. 16); uterus not well developed. Excretory pore? Excretory vesicle?

Discussion: This species resembles *Prosorhynchus freitasi* Nagaty, 1937 and *P. longicollis* Yamaguti, 1953 in general anatomy and relative body size. It differs from *P. longicollis* in position of vitellaria; shape and length of intestine; position of gonads and direction of the mouth; from *P. freitasi* in the arrangement of vitellaria; length of intestine; and position of the gonads.



Prosorhynchus (Skrjabinella) magniovatus Yamaguti, 1938

Length: 1.38 mm.

Width: 0.6-0.65 mm. broad at middle

Oral sucker: Mouth in posterior fourth of body

Acetabulum:

Sucker ratio:

Location acetabulum:

Prepharynx:

Esophagus:

Location genital pore: Ventroterminal

Position testes: Diagonal; rt. at junction of mid. with post. third of body
left at middle of body or a little further behind.

Ovary: Globular, 0.17-0.21 mm. in dia., immediately in front of rt. testis

Eggs: Oval, thick-shelled, 31-39X19-24 μ

Other features:

Host: Conger myriaster (Brevoort)

Locality: Inland Sea, Japan

Reference: Studies on Helminth Fauna of Japan. Part 21. Kyoto, Japan.
Revised edition

Related species: P. aculeatus Odhner
P. uniporus Ozaki
P. scalpellus McFarlane

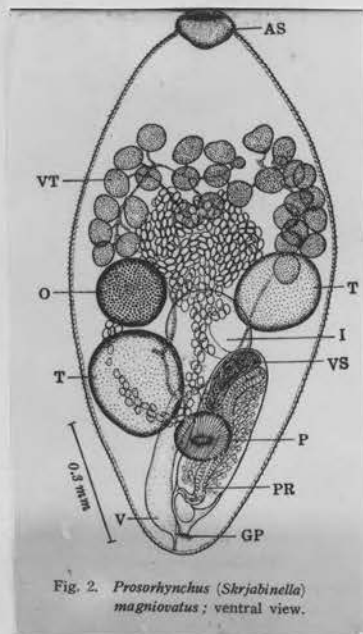


Fig. 2. Prosorhynchus (Skrjabinella) magniovatus; ventral view.

?
Synonym of
aculeatus mura
Differs only in
the larger eggs

Prosorhynchus manteri Srivastava, 1938

Body cylindrical 0.86 to 2.26 by 0.3 to 0.46
Rhynchus 0.1 to 0.12 by 0.08 to 0.1
Pharynx 0.05 to 0.1 by 0.05 to 0.1, $\frac{1}{4}$ from anterior end
Testes oval, tenadem, in middle third, separated by a coil
of the uterus
Cirrus sac 0.28 to 0.6 by 0.08 to 0.14 with# oval seminal
vesicle
Ovary a little in front of anterior testis
Vitellaria lateral in pairs from in front of ovary
to $\frac{1}{5}$ or $\frac{1}{8}$ body length from anterior end
Uterus apparently not reaching anterior to vitellaria
Eggs 19 to 20 by 11 to 13 μ
Excretory bladder from level of vitellaria
Host: Tetradon oblongus Bl.
Locality: Bay of Bengal
Reference: Indian Jour.Vet. Res., 8:317-340



Fig. 9.
Prosorhynchus manteri n. sp.

Kruse, Günther O.W., 1977

Bucephalidae

Prosorhynchus mizellei sp. n.

(Figs. 1 and 2)

HOST: *Aptocyclus ventricosus* (Pallas), Cyclopteridae; Smooth lumpsucker; 9 specimens from 1 host.

TYPE SPECIMENS DEPOSITED: USNM Helminth. Coll. No. 74119 (holotype), 74120, Univ. Nebraska State Mus., H. W. Manter Lab. No. 20314.

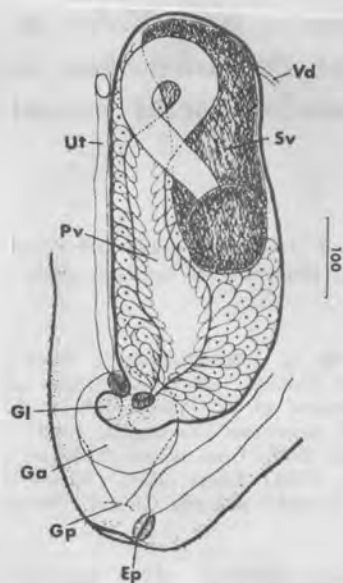
DESCRIPTION (based on 9 specimens): Body subpyriform, 1665–2438 (1879) long by 449–685 (598) wide, tapered anteriorly, rounded posteriorly; tegument spined. Rhynchus conical, 171–196 (180) long by 96–146 (120) wide. Mouth near midbody; pharynx large, round, 130–196 (164) in diameter; esophagus

short, indistinct, apparently contracted; intestine saccular, extending anterodorsally. Testes dextral, rounded, 152–184 (167) in diameter, oblique or tandem, close or overlapping; post-testicular space 441–586 (511), about $\frac{1}{4}$ body length. Cirrus sac sinistral, 400–578 (528) long by 168–240 (200) wide, extending to near pharynx; seminal vesicle occupying anterior half or two-thirds of cirrus sac, sometimes recurved distally, 280–460 (364) long by 104–128 (116) wide; sperm-free duct joining well-developed prostatic complex; genital lobe curved; genital atrium spacious; genital pore subterminal. Ovary 192–224 (211) in diameter, larger than testes and anterior or anterolateral to testes, lateral or posterolateral to pharynx. Vitelline follicles rounded, 25–29 in number, forming arc from level of pharynx halfway to base of rhynchus. Uterine coils few, usually postpharyngeal (extending slightly anterior to pharynx in 2 specimens), joining genital atrium laterally. Eggs 32–40 (37) long by 20 wide. Excretory vesicle extending to posterior testis, dextral to cirrus sac; excretory pore terminal.

DISCUSSION: This species of *Prosorhynchus* is named in honor of Dr. Mizelle. It is most similar to *P. squamatus* Odhner, 1905, which has also been reported from Arctic localities. Both species have the vitellaria forming an arc in the anterior half of the body, the gonads contiguous on the right side, a relatively large

cirrus sac, and the mouth anterior to the cirrus sac; but *P. mizellei* differs from *P. squamatus* in having a more elongated body, a conspicuously larger pharynx, larger eggs, and the vitellaria extending posteriorly to the pharyngeal level (i.e., almost to the anterior of cirrus sac).

A second species of *Prosorhynchus* was represented by a single specimen from *Hemilepidotus hemilepidotus* (Tilesius), Cottidae; it could not be identified.



Host—Epinephelus mystacinus.

Frequency—Present in 1 of 3 hosts examined.

Position—Intestine.

Depth—90 fathoms.

SPECIFIC DIAGNOSIS

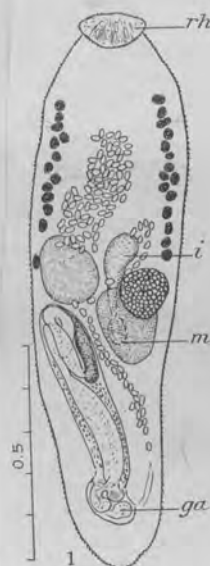
Body flattened, elongate, length 1.293 mm., width 0.361 mm. Rhynchus somewhat extended transversely, muscles weakly developed, 0.154 mm. in transverse diameter. Mouth a short distance posterior to midbody, ventral to right testis; intestine extending forward a short distance anterior to midbody. Testes large, slightly longer than wide, diagonal, more or less lateral, slightly overlapping, the left testis more anterior. Cirrus sac elongate, nearly half-body length, 0.504 mm. in length, extending from genital atrium beyond the right testis, anterior to mouth, to posterior edge of left testis. Genital pore a short distance anterior to posterior end; genital atrium spacious. Ovary round, partly anterior to and partly overlapping dorsally the right testis, lateral to left testis or slightly posterior. Vitelline follicles in two widely separated groups, 13 to 15 follicles on each side, extending from level of ovary to near anterior end. Uterus not extending anterior to vitellaria. Eggs without processes, 25 to 29 by 15 to 17 μ .

COMPARISONS

This species will key to *Prosorhynchus aculeatus* in Eckmann's key (1932). Issaïtschikow (1928) would establish the genus *Skrjabiniella* for *P. aculeatus* on the basis of the position of testes on opposite sides of the body, mouth in posterior half of body, and uterus not extending beyond the vitellaria. These characters do not seem to me to be generic, and *Skrjabiniella* is considered a synonym of *Prosorhynchus*. The present species was considered at first as *P. aculeatus* but a study of vanBeneden's (1870) figure reveals that the present form differs in being more elongate, in more anterior extent of the intestine, in much longer cirrus sac, more anterior genital pore and, above all, in the widely separated rows of vitellaria which in *P. aculeatus* form an arch across the body. In other species of *Prosorhynchus* the ovary is anterior to both testes and all of these organs are more

Prosorhynchus ozakii Manter, 1934
Host: **Mycteroperca bonaci* (C).
Site: intestine.

CURRAN; FROM NANNAS + CABLE, 1964



or less in a row. The description of this species (*P. ozakii*) is based on two specimens (one immature) and more material is needed to confirm the constancy of characters. Even in the immature, less elongate specimen, however, the ovary is far lateral, overlapping the right testis and slightly posterior to the left testis. This arrangement is very different from that in all other species except *P. aculeatus*. *P. aculeatus* has been reported several times from northern waters, but its structure has not been well described.

This species is named in honor of Y. Ozaki, Japanese parasitologist, who has described numerous species of trematodes from fish.

Also: Epinephelus analogus in Panama Pacific
(Sozandares, 1959)

Prosorhynchus ozakii Manter, 1934

Sinonímia — *Prosorhynchus ozakii* Manter, 1934: 267, fig. 1; *Prosorhynchus ozakii* Manter, 1940: 339-340, pl. 33, fig. 13; *Prosorhynchus ozakii* Manter, 1947: 260; *Prosorhynchus ozakii* Yamaguti, 1953: 10; *Prosorhynchus ozakii* Yamaguti, 1958: 18; *Prosorhynchus ozakii* Kohn, 1961: 47; *Prosorhynchus ozakii* Skrjabin, 1962: 393, 429, 432, figs. 232, 233.

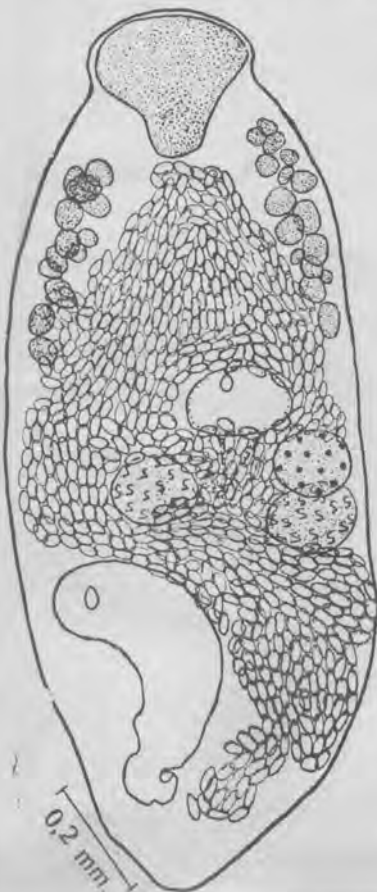
Descrição — Trematódeos alongados, com 1,02 a 1,52 de comprimento por 0,30 a 0,58 de largura. Cutícula lisa. **Rhynchus** com 0,10 a 0,24 de comprimento por 0,10 a 0,26 de maior largura. Bóca no terço médio do corpo. Faringe e esôfago não estudados com detalhe pelo acúmulo de ovos. Ceco intestinal sacciforme. Atrio genital próximo à extremidade posterior do corpo. Bólsa do cirro dirigida do poro genital para diante; mede 0,38 a 0,50 de comprimento por 0,10 a 0,15 de maior largura. Testículos de contorno liso, mais ou menos arredondados, dispostos em diagonal no terço médio do corpo. O testículo mais anterior mede 0,11 a 0,13 de comprimento por 0,12 a 0,14 de largura, e o outro mede 0,12 a 0,14 por 0,10 a 0,17. Ovário de contorno liso, mais ou menos arredondado, situado lateralmente, total ou parcialmente na zona do testículo anterior e com campo total ou parcialmente coincidente com o do testículo posterior; mede 0,11 a 0,12 de comprimento por 0,12 a 0,15 de largura. Útero ocupando quase todo o corpo. Ovos com 0,036 a 0,042 de comprimento por 0,018 a 0,021 de largura. Vitelinos constituídos por folículos arredondados, situados lateralmente no terço anterior do corpo.

Habitat — Divertículos pilóricos de *Garrupa* sp.

Proveniência — Baía de Guanabara, Rio de Janeiro, Estado da Guanabara, Brasil.

Material estudado depositado na Coleção Helminológica do Instituto Oswaldo Cruz, sob o nº 30.283 a-k.

Fig. 1 — *Prosorhynchus ozakii* Manter, 1934. total (nº 30.283 b). Original



KOHN (1967)

Prosorhynchus pacificus, new species **MANTER, 1940**
(Plate 33, fig. 17)

This species was collected four times, as follows:

Host	Locality
<i>Mycteroperca olfax</i> (Jenyns) (type host)	Albemarle Island, Galapagos (type locality)
<i>Mycteroperca xenarcha</i> Jordan	Albemarle Island, Galapagos
Unidentified grouper	James Island, Galapagos

Location: Ceca

Number: Several to many. In the case of both *M. olfax* and *M. xenarcha*, *Prosorhynchus ozakii* also occurred in small numbers.

SPECIFIC DIAGNOSIS OF PROSORHYNCHUS PACIFICUS

Body elongate, about equally wide along most of its length, blunt at anterior end, tapering to a rounded, somewhat pointed posterior end. Length 1.206 to 1.444; width 0.300 to 0.397. Rhynchus large, muscular, cone shaped, longer than wide, width 0.172 to 0.232. Mouth between $\frac{1}{3}$ and $\frac{1}{2}$ body length from anterior end; sac-shaped intestine extending forward; pharynx 0.054 to 0.061 in diameter. Gonads near midbody. Ovary spherical, at pharynx level, to the right, overlapping anterior testis; vitellaria in two widely separated lateral groups, extending from about the level of the ovary halfway to anterior end of body; follicles tending to be arranged in a straight, linear row on each side. Posterior limit of vitellaria always (in 54 specimens) more than $\frac{1}{3}$ body length from the anterior end and often at midbody level or beyond. Mehlis' gland between testes. Uterus not extending anterior to ovary but does extend posterior to genital pore. Eggs light yellow, fairly thin shelled, 24 to 27 by 12 to 17 μ , usually about 25 by 17 μ .

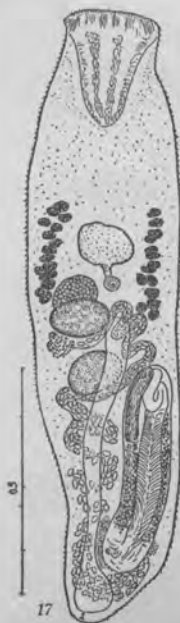
Testes large, subspherical, chiefly postovarian, diagonal, and not far apart, sometimes almost tandem. Cirrus sac large, typical for genus, usually overlapping posterior testis but not reaching to this testis in 20 of 54 specimens. Genital pore some little distance anterior to posterior end of body. Excretory pore terminal; excretory vesicle extending to anterior testis.

Measurements of the type specimen are: Length 1.350; width 0.352; rhynchus diameter 0.215; mouth to anterior end 0.615; pharynx 0.060; cirrus sac 0.427 by 0.113; eggs 24 to 27 by 12 to 14 μ .

The name, *pacificus*, is for the locality.

Comparisons. *P. pacificus* differs in its large rhynchus from such species as *P. squamatus*, *P. grandis*, *P. aculeatus*, *P. ozakii*, and *P. magniovatus*. It differs from *P. crucibulus* in separated rows of vitellaria, more anterior mouth, more narrow eggs, and more tandem testes. It differs from *P. scalpellus*, *P. facilis*, and *P. apertus* in that the uterus does not extend anterior to the ovary. An undescribed species of *Prosorhynchus* from several species of *Mycteroperca* at Tortugas, Florida, is very similar to *P. pacificus*, the only important difference being in size and color of the eggs. It is interesting to note that of 3 species of *Prosorhynchus* from *Mycteroperca* studied by the writer, this species is much more similar to Atlantic collections than to its neighbor, *P. gonoderus*, from the Pacific.

Syn. & P. atlanticus
acc. Hanson, 1950.



Also: from
Mycteroperca
venenosa venenosa
at Bimini
(Sogandares
1959)

FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, VOL. 2, No. 14
reported from red rockfish at
Bermuda by Hanson, 1950

Prosorhynchus pacificus Manter, 1940

Host.—*Mycteroperca venenosa venenosa* (Linn.).

Location.—Pyloric ceca.

Locality.—Bimini, B.W.I. [new locality record].

Discussion.—*Mycteroperca v. venenosa* has 13 pyloric ceca. One cecum, which had a surface area of approximately 320 square millimeters, contained 6 *P. pacificus* and 3 immature lepecreadiids. Some ceca had no trematodes. If trematodes were found, there were more than one per cecum.

P. pacificus has been reported from *Mycteroperca olfax* and *M. xenarcha* in the Galapagos Islands by Manter (1940a) and from *M. venenosa* and *M. microlepis* in Tortugas by Manter (1940); and from *Sebastopyr ruberrimus* in Bermuda by Hanson (1950). This record from Bimini, extends the South-eastern range of *P. pacificus* in the Atlantic.

Hanson (1950) considered *P. atlanticus* Manter, 1940 a synonym of *P. pacificus* Manter, 1940.

Prosorhynchus pacificus Manter, 1940

Gasterostomum sp. Linton, 1910 (from *Mycteroperca bonaci* and *M. venenosa*).

Prosorhynchus atlanticus Manter, 1940.

Hosts: *Mycteroperca bonaci* (3 of 3); *Mycteroperca microlepis* (2 of 2).

Site: Intestine and pyloric caeca.

Discussion: Hanson (1950:75) considered *Prosorhynchus atlanticus*, apparently from a misidentified host, as a synonym of *P. pacificus* on the basis of the variability in the specimens she examined from Bermuda. She noted a wide range in the size of eggs. Nahhas and Cable (1964:174) reported nonintergrading egg lengths in specimens from Curaçao, Jamaica, and Puerto Rico, as I find in my specimens, and they did not accept the synonymy. Winter (1960:187-189), however, reported specimens from Mazatlán, Sinaloa, Mexico, with eggs 29 to 33 by 19 to 20 microns, about the same measurements as found in most Atlantic specimens. I am therefore accepting the synonymy.

Overstreet, 1969.

Velasquez, 1959

Host: *Ambassis buruensis* Bleeker

Location: scales

Locality: Manila Bay, Parañaque, Rizal, Luzon island, Philippines

Prevalence: 4 immature from 1 of 4 hosts examined.

Types and paratypes: U.S. Nat. Mus. Helm. Coll. No. 37689

Specific diagnosis: (Based on 3 specimens). Body broadly elongate, 1.09–1.6 by 0.4–0.48 spinous. Rhynchus cone-shaped with anterior folds, 0.18–0.2 by 0.12–0.2 mm. at greatest breadth, muscular. Mouth in midbody, directed posteriorly; pharynx, 0.1–0.14 by 0.1–0.22 oesophagus well defined, 0.04; gut fairly large, saccular. Gonads in midbody. Testes small symmetrical in one specimen (Fig. 14), tending to be diagonal in others. Cirrus sac, small 0.18 by 0.08; vesicula seminalis coiled; pars prostatica narrow. Genital atrium wide; genital pore subterminal. Ovary tiny, dextral, anterior to testes. Vitellaria consisting of about 3 tiny follicles in arch formation, anterior to gut. Uterine coils posterior to right testis and one specimen between testes; eggs absent. Excretory vesicle? Excretory pore?

Discussion: This species resembles *P. crucibulus* (Rudolphi, 1819) Odhner, 1906 in the relative position of the gut and in the character of the cirrus sac. The rhynchus, however, is very much smaller, more muscular, with anterior folds. Until further details of the life cycle are known, it is tentatively designated as *P. paracribulatus* nov. sp. -

Prosorhynchus luzonicus n. sp.
(Fig. 15)

Velasquez, 1959

Host: *Lates calcarifer* Bloch

Location: intestine

Locality: Malabon, Rizal, Luzon island, Philippines

Prevalence: 3 from 1 of 6 hosts examined

Type: U.S. Nat. Mus. Helm. Coll. No. 37689

Paratypes: University of the Philippines, Dept. of Zoology, Helm. Coll. No. 926

Specific diagnosis: (Based on 3 specimens; measurements from 2). Body elongate; somewhat pointed at posterior end. Length 1.06–2.02 by 0.27–0.45. Rhynchus conical, muscular, 0.1 by 0.18 (one specimen). Mouth between first and second thirds of body; intestine, saccular pharynx rather small, diameter 0.043 (1 specimen). Gonads at midbody. Testes globular tandem; anterior testis smaller than posterior. Posterior testis anterior to cirrus sac, latter large, 0.35 by 0.13 (1 specimen); seminal vesicle partly coiled. Genital pore subterminal. Ovary spherical, small, at pharyngeal level, dextral, in contact with anterior testis but not overlapping it. Vitellaria in 2 widely separated lateral groups about 13 on the right and 15 on the left; follicles rounded, well defined, extending from rhynchus almost to anterior testis. Uterine coils lying between ovary and genital pore. Egg yellowish, 30–39 microns by 17–24 microns. Excretory pore terminal. Extent of excretory vesicle unknown.

Discussion: This species very closely resembles *P. atlanticus* (Syn. *P. pacificus* Manter, 1940) Manter, 1940 and was collected from related hosts belonging to the



Comparative measurements in microns of eggs of the 3 species are as follows: *P. pacificus*, 24–27 by 12–14 (type specimen, Manter); *P. atlanticus* 27–34 by 14–22 (Manter); *P. luzonicus* n. sp. 30–39 by 17–24 Velasquez. The egg of the present species is very much larger than that of *P. pacificus* and *P. atlanticus* and I therefore propose to designate it as a new species, *P. luzonicus*.

18. *Prosorhynchus polydactylus* n. sp. Yam., 1970
(Fig. 18)

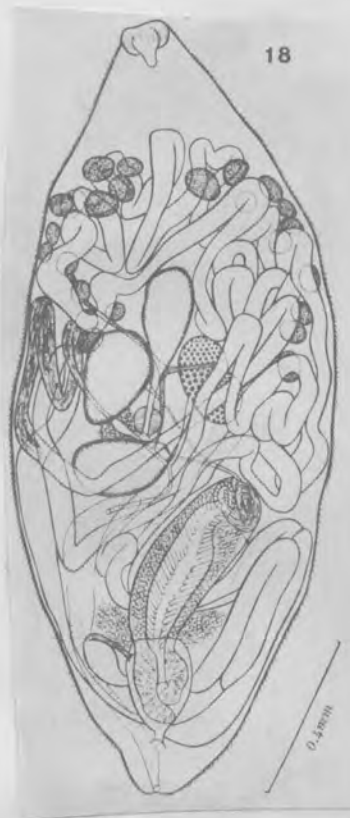
HABITAT: Intestine of *Polydactylus sexfilis*; Hawaii.
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63542.
DESCRIPTION (based on numerous whole mounts): Body fusiform, spinulate, more pointed anteriorly than posteriorly, 0.77-2.5 mm long, up to 0.3-0.75 mm wide in midregion. Rhynchus plug- or wedge-shaped, with broad flat apex, $75-150 \times 75-150 \mu$. Pharynx $60-100 \times 50-90 \mu$, equatorial or postequatorial. Esophagus $37-100 \mu$ long; intestine saccular, retort-shaped, $0.125-0.5 \times 0.06-0.175$ mm, directed forward, with its base at posterior end of anterior third of body in the type.

Testes subglobular, obliquely or directly tandem in middle third of body; anterior testis longer than wide, $0.13-0.22 \times 0.1-0.16$ mm; posterior testis wider than long, $0.1-0.2 \times 0.17-0.3$ mm; in contracted specimens the two testes may be juxtaposed or massed together with ovary near pharynx, so that the position of the testes relative to the ovary or pharynx is too variable to be utilized for specific differentiation. Cirrus pouch subcylindrical, $0.22-0.5 \times 0.11-0.18$ mm, extending into middle third of body. Seminal vesicle retort-shaped, $30-75 \mu$ wide; anterior end of pars prostatica bent back on itself; prostatic complex strongly developed, protruding into genital atrium in form of a two-lobed genital lobe. Genital atrium $0.15-0.3 \times 0.12-0.18$ mm, almost completely occupied by two genital lobes, opening ventrally $0.067-0.35$ mm from posterior end of body.

Ovary subglobular to oval, $0.1-0.27 \times 0.1-0.16$ mm, situated on the left of median line at level of anterior testis or anterior to pharynx, varying in position relative to other organs. Laurer's canal opening behind posterior testis. Shell gland convergent toward point of junction of germiduct with common vitelline duct dorsal to mouth opening. Uterus occupying all available space of body except for anterior part between rhynchus and vitellarian zone. Receptaculum seminis uterinum present. Eggs oval, thick-shelled, embryonated, $21-28 \times 16-20 \mu$. Vitellaria consisting of 11-13 follicles on each side, forming an arc which lies largely in anterior third of body unless the

forebody is extended, and which may or may not be interrupted medianly; posteriormost follicles may reach base of cirrus pouch. Excretory vesicle tubular, hardly reaching base of cirrus pouch; pore terminal.

DISCUSSION: This species closely resembles *Prosorhynchus crucibulum* (Rud., 1819) Odhner, 1905 from Congeridae in general arrangement of internal organs, but differs from it in the rhynchus being very small and in the genital lobe being two-lobed posteriorly.



Prosorhynchus promicropsi, n. sp. Manter, 1940

(Figures 20-22)

Host. *Promicrops itaiara* (Lichtenstein)

Location. Ceca and intestine

Frequency. Present in all of 3 hosts examined

Diagnosis (based on 17 specimens). Body elongate, cylindrical, 1.498 to 1.957 by 0.276 to 0.390; anterior end truncate, posterior end more tapering; most of body about equally wide. Rhynchus cone-shaped, well developed, 0.157 to 0.277 in width by 0.195 to 0.292 in length. Mouth very slightly anterior to midbody; pharynx 0.053 to 0.073 in diameter; esophagus longer than pharynx; intestine elongate, saclike, extending forward. In 13 of 17 specimens, the intestine extended anteriorly beyond the vitellaria, and it may reach beyond the posterior border of the rhynchus (fig. 21).

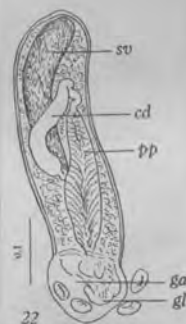
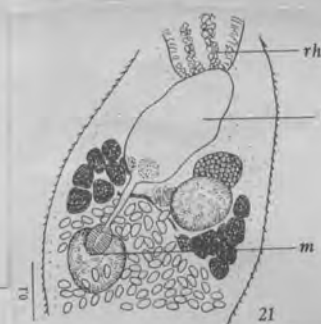
Gonads more or less tandem or diagonal, in midbody region. Ovary slightly to the right or to the left, pretesticular, anterior to pharynx, opposite (and dorsal to) esophagus or intestine, usually overlapping anterior testis dorsally. Mehlis' gland postovarian, dorsal to anterior testis. Vitelline follicles forming two separated, rather compact groups clustered in the pharynx-ovary-testis region; sometimes entirely posterior to ovary, sometimes entirely between the testes, never more than a few preovarian follicles. Uterus entirely postovarian, often entirely posterior to anterior testis, always extending to extreme posterior tip of body. Eggs 25 to 31 by 17 to 20 microns but more uniform in size within any one specimen.

Testes tandem or diagonal, separated by uterus and usually by a few vitelline follicles; anterior testis close to or overlapping ovary. Cirrus sac relatively short and broad, about 1/3 to 1/4 body length (in contracted specimens it may be 1/2 body length), 0.450 to 0.545 by 0.112 to 0.142, not reaching posterior testis; seminal vesicle elongate, almost always 1/2 length of cirrus sac or more; pars prostatica and seminal vesicle overlapping for 1/2 or more of their lengths, connected by a somewhat coiled tube (fig. 22). Genital atrium not appreciably wider than cirrus sac; dorsal genital lobe somewhat larger than ventral, atrial tube short; genital pore some distance (0.144 to 0.262) anterior to posterior end of body.

Excretory vesicle reaching to anterior testis. Nervous system sometimes conspicuous; transverse fibers extend across dorsal posterior portion of rhynchus; longitudinal nerves far lateral.

The name *promicropsi* is for the host.

Comparisons. This species differs from most others in the genus in the following combination of characters: far anterior extent of intestine, extent of the separated, bunched vitellaria, and the postovarian uterus. It seems to be most similar to *P. gonoderus* Manter, 1940, from which it differs in more posterior mouth and gonads and in that the intestine almost always extends anterior to the vitellaria. It differs from *P. costai* Travassos, Artigas, and Pereira, 1928, in much smaller eggs and in more posterior extent of uterus. It differs from *P. pacificus* Manter, 1940 and *P. atlanticus* in anterior extent of the intestine and in lesser longitudinal extent of the vitellaria. Also, eggs of *P. promicropsi* tend to be relatively wider, and the cirrus sac never reaches the posterior testis, whereas it may or may not in *P. atlanticus* and *P. pacificus*. The *Prosorhynchus* species of groupers are all similar but can be distinguished from one another by slight differences.



Prosorhynchus promicropsi Manter, 1940
Host: *Promicrops itaiara* (J).
Site: intestine.

JAMAICA; FROM NAKHAS + CABLE, 1964

Prosorhynchus rotundus, new species **MANTER, 1940**

(Plate 33, fig. 15)

Host: *Rypticus safronaceus bicolor* (Val.)

Location: Intestine

Locality: Albemarle Island, Galapagos

Number: 3 specimens from a single host

Bucephalidae

Eponychalidae

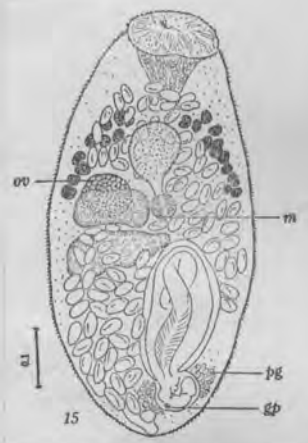
SPECIFIC DIAGNOSIS OF PROSORHYNCHUS ROTUNDUS

Body relatively small and broad, ovoid, rounded at each end but more broadly rounded posteriorly, 0.712 to 0.825 by 0.360 to 0.367. Body, including the flattened surface of the rhynchus, covered with scalelike spines. Rhynchus fairly large and well developed, the flattened, exposed anterior surface measuring 0.150 to 0.157 in diameter. Internal portion of rhynchus cone shaped, tapering slightly to a fine point which in all three specimens is recurved at its tip to form a hooklike crook. Mouth almost exactly at midbody; pharynx about 0.075 in diameter; sac-shaped intestine extending forward almost to base of rhynchus. Gonads variable in location. Ovary to the right, slightly anterior to but overlapping pharynx; always overlapping and usually entirely dorsal (or ventral) to anterior testis. Vitellaria in 2 separated lateral groups extending from level of pharynx to base of rhynchus. The 2 groups of follicles converge anteriorly and almost but not quite meet near base of rhynchus. Total number of follicles about 23. Uterus filling most of body, extending forward beyond anterior limit of vitellaria, overlapping basal portion of rhynchus, posteriorly reaching to level of genital pore. Eggs very large in proportion to body size, 39 to 44 by 20 to 23 μ .

Testes close together, tandem, diagonal or lateral to each other; normally probably tandem. Anterior testis overlapping ovary, about at level of pharynx. Both testes wider than long; posterior testis overlapping anterior edge of cirrus sac. Cirrus sac large, 0.300 to 0.390 by 0.110 to 0.136. It may be more than half body length. It contains a coiled tubular seminal vesicle, long pars prostatica, large prostate gland, and has a very thick wall (11 to 12 μ). Genital atrium subspherical, thin walled, with large genital lobes. It is surrounded by a very well-developed mass of gland cells for which the term *atrial gland* is suggested. Such glands have been described in *P. squamatus* by Odhner, who compared their appearance to that of a shell gland and considered that they secreted the capsule for the spermatophore. Genital pore a short distance in front of the anterior end, median or to the left. Excretory pore terminal; excretory vesicle extending to posterior testis.

Comparisons. This species is notable for the small body size together with very large egg size. *P. costai* has even larger eggs but differs in its more elongate body, more posterior uterus, shape and position of testes, and relative size of the cirrus sac. *P. rotundus* differs from *P. aculeatus* in its better-developed rhynchus, more anterior mouth, separated vitellaria, and much larger eggs. *P. magniovatus* Yamaguti, 1938 has eggs almost as large but has a smaller flat rhynchus, confluent vitellaria, and much more posterior mouth. *P. scalpellus* McFarlane, 1936 is probably most similar but differs in more narrow eggs, more elongate body, more posterior mouth, and more rounded testes. It lacks the hooklike curve at the tip of the rhynchus, and the host is different. Additional material may show, however, that *P. rotundus* is a synonym of *P. scalpellus*.

Discussion. The variation in the position of the posterior testis seems to be determined by pressure from the cirrus sac. When the cirrus sac is large and extends very far forward, it pushes the testis forward even until it may be anterior and to the left of the ovary. The fact that in such specimens the testis is misshaped by such pressure indicates that it may have been done by the process of killing the worm under a cover glass.



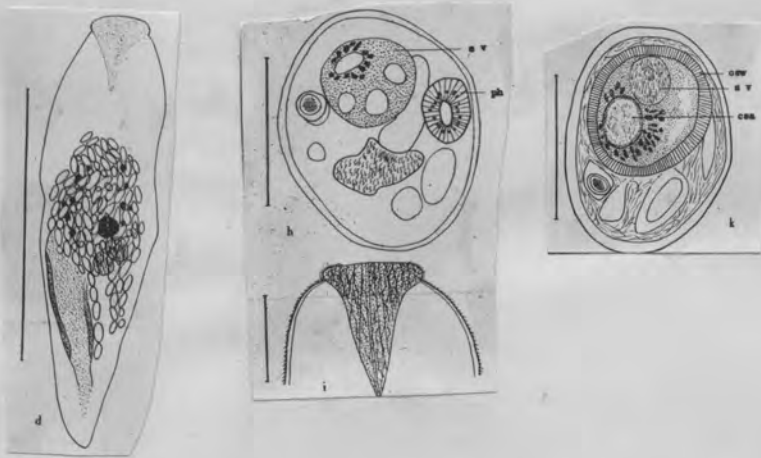
Prosorhynchus scalpellus McFarlane, 1936

Length 0.61 to 0.78; width 0.14 to 0.22. Body depressed anterior to uterus. Pharynx posterior to middle of body (58 by 32 μ). Intestine clavate, anterior to pharynx and without cellular projections into lumen. Vitelline follicles small, dorsal to internal organs, their posterior limit being the region of the ovary, their anterior limit being that of the uterus. Ovary globular, 52 μ in diameter, immediately in front of anterior testis. Eggs collapsed, 32 to 40 by 16 μ . Testes posterior to ovary, equal in size, 60 μ in diameter, contiguous, tandem or lateral. Cirrus sac thick-walled, 0.39 from posterior end of body. Seminal vesicle originated outside of cirrus sac and enters that organ at its anterior end. Cirrus straight, surrounded by prostate glands, opening into genital atrium which is in the posterior part of the body. Genital pore subterminal on ventral surface.

Host: Scorpaenichthys marmoratus (Ayres) Giant marble sculpin
Locality: Departure Bay, B.C.

Compared with ~~the~~ P. facilis and P. apertus by the author

This seems to be a species with the weak type of rhynchus.



Nagaty considers it a synonym of P. cruciculus

But:

Eggs more narrow

uterus anterior to vitellaria

cirrus sac relatively longer

Durio & Manter, 1968

Prosorhynchus serrani n. sp.

(Fig. 8)

SYNONYM: *P. crucibulus* (Rud.) of Nagaty, 1937, nec Rudolphi, 1819, in *Serranus* (= *Variola*) *louti* (Forskål), Red Sea. New synonymy.

HOST: *Serranus louti* (Forskål); Serranidae.

NUMBER: Thirteen from one host.

HOLOTYPE: USNM Helm. Coll. No. 63305.

DESCRIPTION: Body elongate, about uniformly wide; anterior end truncate; posterior end broadly rounded; length 1.027–2.245; width 0.226–0.487. Rhynchus conical, flattened anterior fold with broad ventral indentation, 0.185–0.267 long by 0.156–0.217 wide; cone relatively narrow. Mouth median at mid-body; pharynx 0.065–0.080 in diameter; esophagus short; cecum extending anteriorly, length variable, 0.096–0.301.

Testes rounded to ovoid, tandem to diagonal, to right of midline, separated by two coils of uterus; anterior testis immediately posterior to midbody. Cirrus sac to left of midline, 0.361–0.574 long by 0.092–0.174 wide; thick-walled; always reaching or overlapping level of posterior testis; separated from posterior testis by uterus and excretory vesicle; containing curved, tubular seminal vesicle about one-third length of cirrus sac; short but sometimes looped, sperm-free duct and pars prostatica often but not always constricted near middle to appear bipartite. Genital atrium spacious, with large atrial lobe. Genital pore ventral, about 0.15 from posterior end of body.

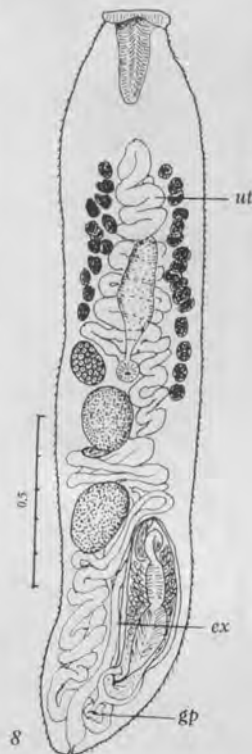
Ovary immediately pretesticular, near mid-body, to right of midline, lateral to pharynx. Mehlis' gland and yolk reservoir near posterior end of anterior testis; sperm cells in proximal coils of uterus. Vitelline follicles large, in lateral rows, 13 to 18, usually 15 or 16, on each side; rows usually not meeting anteriorly, but forming an arc in two (of 13) specimens; posterior extent of vitelline follicles near ovarian level; anterior extent variable, rarely to base of rhynchus. Uterus extending anteriorly dorsal to pharynx and cecum; anterior

limit usually near anterior limit of vitellaria, sometimes anterior to vitellaria to base of rhynchus, in one specimen not anterior to cecum; descending uterus passing between testes and extending postatrially. Eggs 24–29 by 15–17 μ .

Excretory pore terminal; excretory vesicle extending to right of cirrus sac, curving to left of posterior testis, ending near anterior end of latter.

DISCUSSION: This species agrees well with Nagaty's (1937) "*P. crucibulus* (Rud., 1819)" from the same host from the Red Sea. It cannot be *P. crucibulus* because of the smaller size; smaller, more slender rhynchus; pretesticular ovary; and uterine coils lying between the testes. A related species is *P. tsengi* Tsin, 1933 (syn. *Gotonius platycephali* Yamaguti, 1934) which, however, has a cirrus sac not reaching the posterior testis, a longer excretory vesicle, and shorter rhynchus.

Some details of the cirrus sac of species of *Prosorhynchus* have not been well delineated in either descriptions or figures. In most, if not all, species the tubular seminal vesicle bends about 180° and becomes a fairly wide, thin-walled tube free of sperm cells. Such a tube is present in every specimen of 14 species of the genus in the Manter collection. Since it connects the seminal vesicle with the "pars prostatica" (actually in *Prosorhynchus* an elongate prostatic vesicle), it must at times contain sperm cells, probably only temporarily. The true condition in the type species, *P. squamatus* (Rud.) Odhner, 1905, is questionable. There is evidence that more than one species have been considered to be *P. squamatus*.



P. serrani

The Frosorhynchus crucibulum of Nagaty, 1937

Renamed: P. serrani by ##### Durio & Manter.

Host: Serranidae. Serranus louti (Forsk.) in Red Sea
Also, in same host in New Caledonia

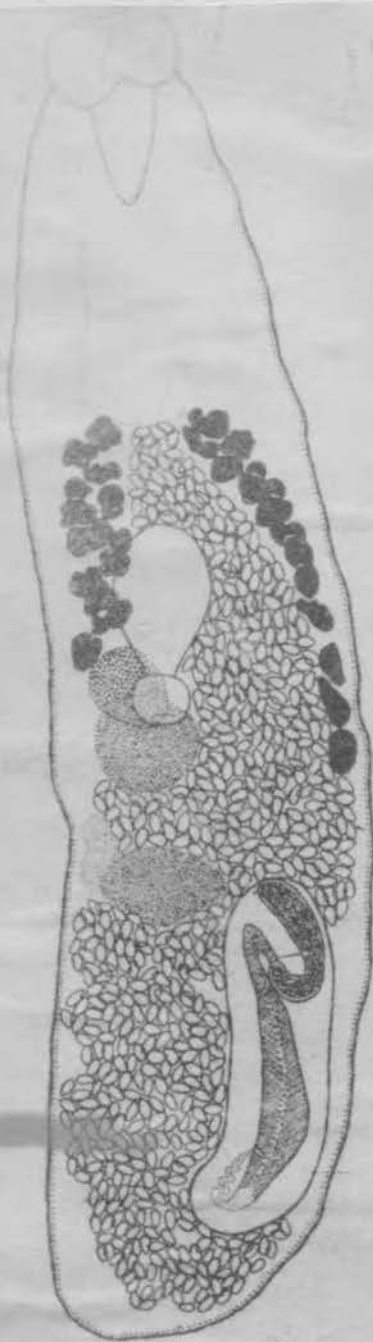


Fig. 48

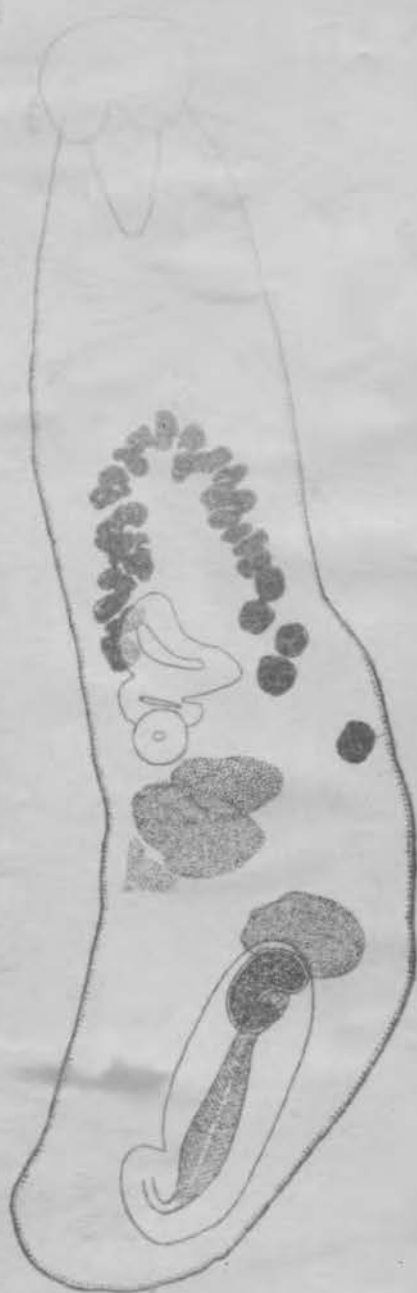


Fig. 49

H. F. Nagaty, ad nat. del.

Prosorhynchus sphyraenae, sp. nov. CHANGDONG AND JIWEI, 1976

Host: *Sphyraena jello* C. et V. and *S. pinguis* Günther.

Location: Intestine and pyloric caeca.

Locality: Sanya, Hainan Dao, Nan Hai, China.

Date: Nov. 11, 1959 and Nov. 19, 1959.

Infection: 34 specimens from one of seven *S. jello* and 23 specimens from one of 23 *S. pinguis*.

Body elongated. Cuticle spinose. Rhynchus wedge-shaped, terminal, with about 5 lobes on its outer border. Pharynx anterior to midline. Oesophagus short. Caecal sac, extending posteriorly and ending at ovarian level.

Testes oval shaped, tandem in posterior half of body. Cirrus sac cylindrical, extending anteriorly to pretesticular level; seminal vesicle ovoid, pars prostatica long, 0.351—0.367 mm. in length, surrounded by well developed prostate cells and ending into genital pore near posterior end of genital lobe.

Ovary pretesticular, elliptical, far apart from anterior testis. Mehlis' gland ovoid, 0.072—0.090 × 0.054—0.072 mm., located between ovary and anterior testis. Vitellaria in anterior part of posterior half of body, in two short lateral bands about 1/5 length of body, anterior extent of vitelline follicles at ovarian level or slightly forward and posterior extent at either pretesticular level or extending to post-testicular level. Uterus descending from oötype and immediately ascending between testicular space and extending far anterior to vitellaria, then descending to left of gonads and cirrus sac.

Eggs oval shaped, numerous clouding in uterine coils.

Excretory vesicle tubular, parallel with cirrus sac.

Discussion: *P. sphyraenae* sp. nov. is morphologically similar to *P. longicollis* Yamaguti, 1953, *P. arabianus* Srivastava, 1938 and *P. longus* Velasquez, 1959. It is distinguished from *P. longicollis* in the distribution of the vitellaria, position of the uterine coils and cirrus sac; and from both *P. arabianus* and *P. longus* in the position of the vitellaria and the cirrus sac. The new species is named after the generic name of the host.

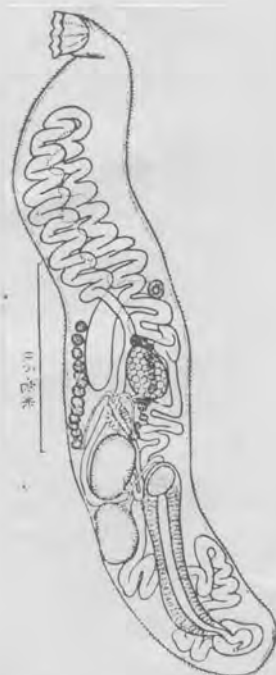


图3 野前吻牛首吸虫, 新种
Prosorhynchus sphyraenae
sp. nov. 的腹面图。

种 名	野前吻牛首吸虫 <i>Prosorhynchus sphyraenae</i> sp. nov.
虫体与器官量度	
体长 Body length	1.770—1.787
体宽 Body width	0.284—0.301
前吸器 Rhynchus	0.084—0.117 × 0.117—0.134
咽 Pharynx	0.067 × 0.050
食道 Oesophagus	0.033 × 0.033
肠囊 Caecal sac	0.367 × 0.084
前睾 Anterior testis	0.117—0.184 × 0.134—0.167

后睾 Posterior testis	0.084—0.184 × 0.117—0.150
生殖囊 Cirrus sac	0.484—0.635 × 0.084—0.117
贮精囊 Seminal vesicle	0.100—0.200 × 0.067—0.080
卵巢 Ovary	0.150—0.167 × 0.080—0.117
卵黄腺数目 Number of vitelline follicles	
左侧 left side	10—16 个
右侧 right Side	10—16 个
卵黄腺滤泡大小 Size of vitel line follicle	0.050 左右
卵子 Ova (μ)	15—18 × 12

***Prosorhynchus squamatus* Odhner, 1905**

SYNONYMS: *Gasterostomum armatum* (Molin) of Levinsen (1881), Olsson (1868) and Stafford (1904).
Prosorhynchus crucibulum (Rudolphi) of Zhukov (1963), Reimer (1970).

HOST AND LOCALITY

Myoxocephalus scorpius, intestine, (1/1).

Green Bank (45° N., 55° W.; depth 82 m)

Other known hosts in eastern Canadian waters are *Brosme brosme*, *Hemitripterus americanus*, *Hippoglossoides platessoides* and *Hippoglossus hippoglossus*. Myers (1959) records it as a 'pseudoparasite' of the elasmobranch *Squalus acanthias* in the Gulf of St. Lawrence. This species is found in the north Atlantic Ocean, the Arctic Ocean and the north Pacific Ocean. The most recent summaries of its status are by Matthews (1973) and Brinkmann (1975).

From BRAY, 1979

Prosorhynchus stunkardi n. sp. (FIGURE 6) Siddiqi And Cable, 1960

Description based on 15 specimens with characters of the genus. Body elongate, 1.056 to 1.227 long, 0.171 to 0.264 wide; anterior half spatulate, posterior half cylindrical. Cuticle distinctly spinose from anterior end to about level of pharynx. Rhynchus oval to pyriform, muscular, 0.052 to 0.118 by 0.064 to 0.099, without papillae. Mouth median, posterior to mid-level; pharynx small, spherical, 0.039 to 0.052 in diameter; esophagus not evident, intestine small, oval in shape. Testes 2, entire, 0.078 to 0.082 by 0.064 to 0.067, close together, slightly to left of midline, posterior to ovary. Cirrus sac long, usually extending to posterior testis; with small, rounded seminal vesicle, well-developed tubular pars prostatica and prostate cells. Genital pore ventral, near end of body. Ovary entire, 0.067 to 0.097 by 0.052 to 0.059, to left of midline, pretesticular, near intestine and anterior testis. Vitellaria in 2 short, lateral bands of small follicles immediately anterior to level of pharynx. Uterus spacious, from posterior end of body to level of pharynx. Eggs very numerous, colorless or yellow, 0.016 to 0.018 by 0.011 to 0.015. Excretory system not observed.

Host: *Scomberomorus* sp.

Site: intestine and ceca.

Locality: Puerto Real, P. R.

Type specimen: Holotype No. 39305.

This species is similar to *P. freitasi* Nagaty, 1937, and *P. facilis* Ozaki 1924 in general body shape and disposition of gonads, but differs from *P. freitasi* in the shape of the rhynchus, more anterior location of the vitellaria and size of eggs. It differs from *P. facilis* in size and shape of the rhynchus, size and extent of vitelline follicles, and in egg size.



(Figs. 1 and 2)

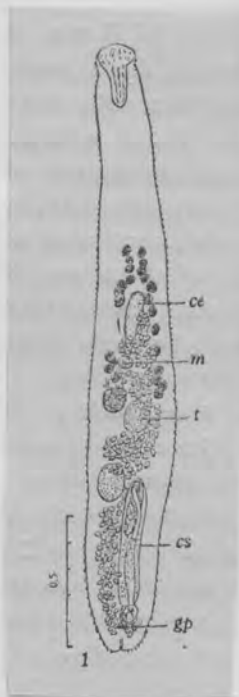
Synonym: the *P. facilis* (Ozaki, 1924) of Nagaty, 1937 from *Caranx* sp.

Host: *Plectropoma maculatum* (Bloch), kawa kawa (Serranidae).

Location: intestine.

Type specimen: U. S. Nat. Mus. Helm. Coll. No. 48728.

Description (Based on 17 specimens with measurements on 7 selected for range of variation): Length 1.778 mm. to 2.282 mm.; greatest width 0.285 to 0.339 mm. or 1/6 to 1/7 length. Rhynchus 0.207 to 0.277 mm. long by 0.140 to 0.161 mm. wide, length about 1.5 times width. Mouth near midbody or, usually, a little posterior to midbody; intestinal cecum extending forward; pharynx 0.065 to 0.076 mm. long by 0.076 to 0.084 mm. wide. Gonads tandem or, usually, somewhat diagonal. Ovary pretesticular. Vitelline follicles meeting, or rarely almost meeting, in an



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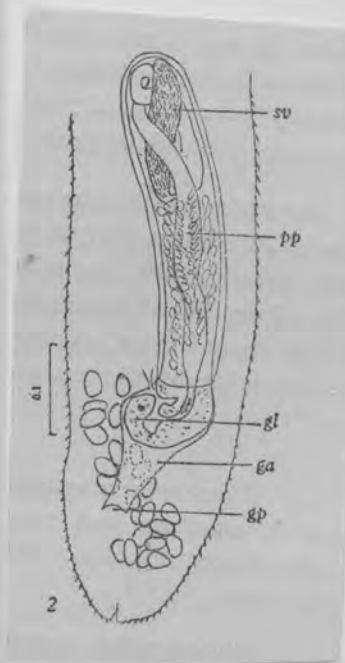
New Gasterostomes from Fiji

(4)

arc 0.420 to 0.789 mm. from anterior end of body; that is, about 1/3 or slightly more of the body length is anterior to the vitellaria. About 7 or 8 vitelline follicles on each side form the anterior arc; lateral rows extend backward to level of ovary; follicles in these rows may be somewhat separated; total number of follicles on the left side 11 to 17, on the right 11 to 16. Anterior extent of uterus a little posterior to end of intestine; in one specimen a little anterior to intestine, never anterior to vitellaria; extending posterior to genital pore; usually a coil between testes. Eggs 27 to 34 by 19 to 22 μ . Testes tandem or slightly diagonal, sometimes close together, usually separated by uterus. Cirrus sac (not including atrium) 0.308 to 0.423 mm. long by 0.092 to 0.115 mm. wide; it may extend to, but not anterior to, the posterior testis; containing a tubular seminal vesicle, a pars prostatica which coils near the base and then extends the length of the sac; genital lobes consisting of a large posterior lip and a slender anterior lip; the posterior lobe curves to turn anteriorly and fill much of the atrium.

Discussion:—This species appears to be the same which Nagaty (1937: 108) collected from *Caranx* sp. in the Red Sea and identified as *P. facilis*. It differs, however, from *P. facilis* in that the uterus never extends anterior to the vitellaria and does extend posterior to the genital pore. *P. freitasi* Nagaty, 1937 from *Serranus guttatus* in the Red Sea differs in much smaller rhynchus and in that the vitellaria and other organs are limited to the posterior half of the body.

The species is named in honor of Dr. G. S. Thapar.



Excretory vesicle extends to anterior edge of posterior testis

In Australia in Choerodon albigena (DeVis) A111b

Family BUCEPHALIDÆ Poche, 1907

PROSORHYNCHUS TRIANGULARIS sp. nov. Plate 1, fig. 1. *Tubangui & Masilungan, 1944*

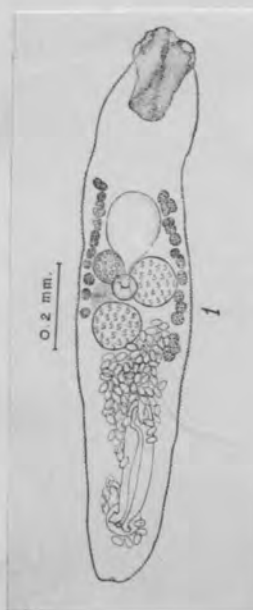
A single specimen of this parasite is found in the collection.

Description.—Body elongated, 1.35 by 0.27 millimeters. Cuticle armed with numerous small spines. Rhynchus well developed, roughly triangular in outline, 0.20 by 0.14 millimeter. Pharynx equatorial, 0.06 millimeter in diameter; oesophagus short; intestine saccular, anterior to pharynx, 0.21 by 0.13 millimeter.

Testes globular, one immediately and obliquely behind the other; first testis 0.13 millimeter in diameter, on the left side of pharynx and partly overlapped by latter in ventral view; second testis 0.12 millimeter across, behind pharynx. Cirrus sac 0.35 by 0.07 millimeter, in posterior third of body length, about 0.14 millimeter from posterior extremity; incloses small, coiled vesicula seminalis and long straight cirrus, the greater length of which is surrounded by numerous prostatic cells. Genital pore median, ventral, about 0.10 millimeter from posterior end of body, leads to genital sinus.

Ovary subglobular, 0.08 millimeter in diameter, on right side of median line opposite anterior testis and partly overlapped in ventral view by antero-lateral border of pharynx. Oviduct

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originates from posterior border of ovary. Shell gland and ootype complex lateral to pharynx, between ovary and second testis. Uterus confined in posterior region of body, behind testes. Vitellaria lateral, in roundish follicles, of which there are 15 on the left side (arranged in 5 groups of 3 each) and 13 on the right side; they extend from level of anterior border of intestine to level of posterior border of second testis. Eggs oval, slightly asymmetrical, yellowish, thick-shelled, operculated, 30 to 32 by 18.5 to 20 microns; some of them show at the abopercular end a filament similar to that described by Eckmann (1932) for the egg of *Prosorhynchus crucibulus*.

Excretory pore posteroterminal.

Host.—*Glossogobius aureus*.¹

Location.—Intestine.

Locality.—Manila.²

Type specimen.—Philippine Bureau of Science parasitological collection No. 660 (deposited in the Bureau of Science for safe-keeping).

Of the known members of the genus *Prosorhynchus* Odhner, 1905, this trematode most closely resembles *P. crucibulus* (Rudolphi, 1819), as described by Eckmann (1932). It may be distinguished from the latter by the following characters: the arrangement of the genital glands and the extent of the uterus and the vitelline glands. In *P. triangularis* the testes and ovary are arranged in triangular fashion around the pharynx; in *P. crucibulus* they are arranged in linear series on one side of the pharynx or the testes may be located behind the pharynx with the ovary on the medial side of the first testis. The uterus of *P. triangularis* is confined in the posterior region of the body behind the testes, while that of *P. crucibulus* reaches anteriorly to the anterior level of the intestine. In *P. triangularis* the vitellaria reach posteriorly to the posterior level of the second testis, while in *P. crucibulus* they extend only as far as the anterior level of that organ.

2. *Prosorhynchus truncatus* ~~n. sp.~~ S.C. Verma, 1936

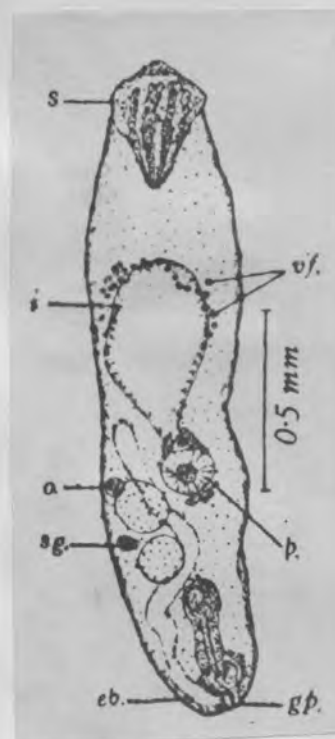
Description. Two specimens of this trematode were obtained from the intestine of *Araus jatinus*, a small fish, dissected at Puri, Bay of Bengal. One of these, the mature one, got smashed in an attempt to press it so as to render visible any filaments on the eggs. Fortunately, this happened after the dimensions of the worm and the eggs had been noted. The following description is therefore based on a single specimen in which the eggs are not yet developed.

The worm has an elongate, cylindrical, body more than four times as long as thick. The sides are nearly parallel, except for a constriction in the oesophageal region. At the anterior end is a truncated rhynchus with its broader margin in front, while the posterior extremity is rounded and less broad than the opposite end. In length the fluke measures 1.76 and in maximum breadth, which lies at the level of the pharynx, 0.42. The mature specimen which was crushed measured 2.6 long and 0.6 broad. Fine cuticular spines barely projecting beyond the surface adorn the greater part of body surface. The anterior sucker or rhynchus is triangular in outline, with the apex directed inwards, and measures 0.25 across, being about as long as broad.

The pharynx is globular and situated at about one third the body length from the hind end. It is 0.15 in diameter and its actual distance, from the two extremities to the nearest margin, comes to 1.02 and 0.59 respectively. A cluster of gland cells, full of yellowish granules, is clearly visible along the front margin of the pharynx, and another along its hind border. The oesophagus is about 0.084 long and nearly two-thirds as broad. It is short and dilates into a forwardly directed saccular intestine 0.46×0.3 in size. The intestine is shaped very much like a balloon and reaches to within 0.51 of the head end.

The female as well as the male gonads lie along the right side of the body. The ovary lies close to the lateral wall of the body, on same level as the mouth opening. It is separated from the pharynx by a space equal to the diameter of the posterior testis, but is in close contact with the antero-lateral border of the anterior testis. It is smaller than the testis and, probably owing to the worm being immature, it measures only 0.06 in diameter; but in the adult specimen lost, it was half as big as the adjacent male gonad. The shell glands form a compact oval mass, between the two testes, which is of nearly same size as the ovary, and lies along the same longitudinal line as the latter. The vitellaria consist of twenty-nine, small rounded, follicles $0.017-0.02$ in diameter. They are arranged in a semi-circle, along the anterior curve of the intestine. The follicles do not extend backwards beyond the middle level of the intestine.

The testes occur one behind the other, somewhat obliquely in the third-fourth of the body. The anterior is situated just postero-internal to the ovary with its long axis oblique. It is ovoidal in outline and measures 0.151×0.134 . The posterior testis is separated from the anterior by a narrow gap and is slightly smaller but more rounded than it. It is 0.134 in diameter. The cirrus pouch is short, thickly built, 0.33 long by 0.08 wide, and extends inwards to the level of the hind margin of the posterior testis.



IMMATURE SPECIMEN

The part enclosing the vesicula seminalis is broader than the part containing the pars prostatica. The genital atrium is also broader than the cirrus pouch proper; so that the cirrus sac, with the genital atrium, presents a dumb-bell shaped appearance. The genital papilla or tongue is, as usual in gasterostomes, muscular and occupies the atrial cavity. Surrounding the atrium is a dense cluster of unicellular gland cells. The genital pore lies at the end of a short conical passage leading from the atrium towards the ventro-posterior end.

The excretory bladder takes the form of a sinuous, tubular, structure extending forwards to about the middle of the body, as indicated in Figure 2, eb. It opens externally by a minute terminal aperture close behind the genital pore.

The eggs measured 35μ - 40μ by 18μ - 20μ , in the specimen lost.

Discussion. From the foregoing account of the fluke and the diagnostic key of the species of the genus *Prosorhynchus* given by Eckmann, 1911, it is evident that the form above described is new to science. The worms included by Eckmann in his key, *P. aculeatus* - *P. squamatus* Odhner, 1905, *P. crucibulus* (Rudolphi, 1919) and *P. facialis* Ozaki, 1924 are all readily distinguished from the Indian species by their body form and size, and by the relative size and position of the testes, the vitellaria, the intestinal sac and the cirrus pouch. Eckmann has, however, not included in his paper *P. grandis* Lebour, 1908 and *P. uniporus* Ozaki, 1924. Both the latter named species also differ materially from the parasite under discussion, in body shape and size as well as in the relative disposition and size of internal organs, particularly so in the more forward location of the vitellaria, the ovary and the intestinal sac of the above described species. *P. uniporus*, the Japanese representative, is further differentiated from the Indian form by the position of its testes which lie on opposite sides of the cirrus sac. Therefore the parasite in discussion is new and named *Prosorhynchus truncatus*, but its specific diagnosis is reserved until more material is available.

Ch'in, S.M. 1933
Proserhynchus tsengi Tsing, 1933 Gasterostomata

syn. *Gotonius platycephali* Yamaguti, 1934

Size 2.43 by 0.38 mm. Rostellum 0.14 mm. in diameter, funnel-shaped with an elevated anterior border. Pharynx 0.074 mm in diameter, located at about midbody. Esophagus 0.08 by 0.025 mm. Intestine 0.26 by 0.1 mm. directed antero-dorsally. Oval to globular testes, tandem, 0.125 mm. apart in anterior portion of posterior half of body. Anterior end of anterior testis at pharynx level. Cirrus pouch 0.37 by 0.07 mm. with its anterior end 0.15 mm. behind the posterior testis. Seminal vesicle U-shaped with an inflated basal portion. Genital papilla conspicuous. Ovary globular, anterodorsal to anterior testis. Laurer's canal present. Uterus extends forward as far as anterior limit of vitellaria. Vitellaria 13 on each side from about 0.4 mm. from anterior end to the ovary on the right but to the anterior testis on the left. Eggs 26 by 30 by 17 to 19 μ . Excretory vesicle to the ovary.

In one specimen there were 14 vitellaria on one side and 17 on the other.

Host: pyloric ceca and intestine of *Platycephalus indicus*

Locality: Toyama Bay, Japan

Compared with *G. facilis* but differing in egg size.

Gotonius platycephali
 Yamaguti, 1934 is a
 synonym of *P. tsengi*
 Tsing, 1933 —
 from Yamaguti, Syn.
 Helms, 1958
 first in Yamaguti, 1954.

see Tsing, 1933
 J. Sci. Nat. Univ
 Shantung 1: 379-392
 9 figs.

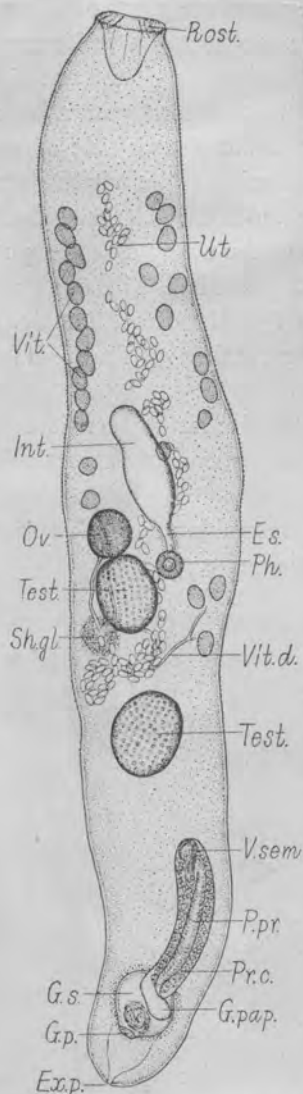
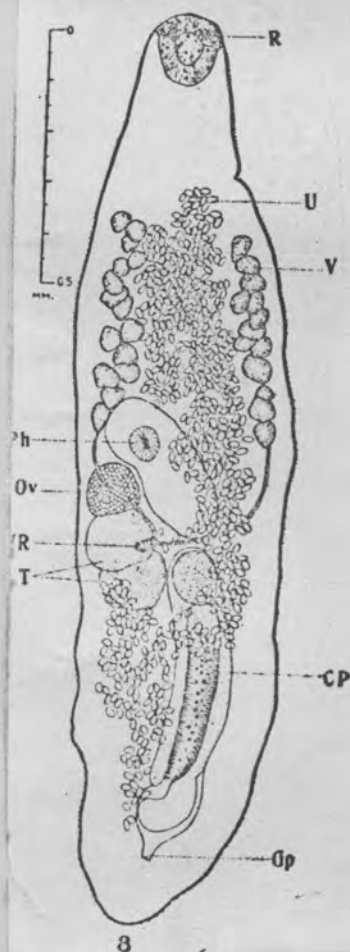


Fig. 14. *Gotonius platycephali*;
 ventral view.
 Type 2.43 x 0.38 mm.



From Ch'in 1933
 (holotype)

16. *Gotonius platycephalus* sp. Yamaguti, 1934

DESCRIPTION. This trematode was found in the pyloric appendages and the small intestine of *Platycephalus indicus* from Toyama Bay. The cylindrical body is entirely covered with exceedingly small spines arranged in quincunx. The type is 2.43 mm long by 0.38 mm broad. The rostellum, 0.14 mm in diameter, is funnel-shaped with an elevated anterior border. The cephalic nerve commissure lies about 0.22 mm from the anterior extremity of the body. The pharynx, 0.074 mm in diameter, is located at about the middle of the body. The esophagus is 0.08×0.025 mm and surrounded by numerous subcuticular cells. The intestine, 0.26×0.1 mm, is directed anterodorsally.

The oval to globular testes, $0.17-0.18 \times 0.13-0.15$ mm, lie tandem 0.125 mm apart from each other in the anterior part of the body, the anterior end of the anterior testis level with the pharynx. The cirrus pouch is 0.37×0.07 mm with its anterior end 0.15 mm behind the posterior testis. The vesicula seminalis is U-shaped with an inflated basal portion. The pars prostatica is highly developed. There is a

conspicuous genital papilla projecting into the genital sinus. The latter opens ventrally 0.16 mm in front of the posterior end of the body.

The globular ovary, 0.095 mm in diameter, lies anterodorsal to the anterior testis. The germiduct arising from the posterior end of the ovary passes backwards along the dorsal surface of the anterior testis and curving round its posterior border receives the common vitelline duct and then penetrating the shell gland continues into the uterine duct. The Laurer's canal originating from the germiduct near the posterior end of the anterior testis opens dorsally after a sinuous course. The uterine duct passes backwards and then turning forwards extends on the sinistrodorsal side of the anterior testis and ovary as far as the anterior limit of the vitellarium. The small globular vitelline follicles, 13 on each side, extend from about 0.4 mm behind the anterior extremity of the body to the ovary on the right, and farther backwards than the anterior testis on the left. The eggs are oval, thick-shelled and measure $0.026-0.03 \times 0.017-0.019$ mm. The long tubular excretory vesicle with a terminal opening reaches to the level of the ovary.

In one paratype about 2.5 mm long the right vitellarium consists of 14 and the left of 17 follicles; the testes and ovary measure respectively about 0.18 mm and 0.13 mm in diameter.



Prosorhynchus uniporus Ozaki 1924

Body oval, 1.2 to 1.7 mm by 0.52 to 0.7 mm. anterior end pointed, posterior end truncate. Rhynchus at the anterior end of the body, 0.1 to 0.12 mm long, 0.12 to 0.14 mm. broad. Skin spiny. Pharynx at one quarter of body length from the posterior end, 0.08 to 0.12 mm in diameter. Intestine a simple clavate sac extending to the center of the body. Testes two, one on either side of the intestine, globular to ovoid, about 0.2 to 0.3 mm in diameter. Ovary small, globular, 0.12 to 0.18 mm in diameter closely in front of the right testis. Cirrus pouch large, 0.34 to 0.5 mm. long, 0.11 to 0.17 mm. broad, with its front end in contact with the right testis; genital opening at the posterior end of the body. Vitelline follicles spherical, 0.035 to 0.05 mm in diameter, arranged in a symmetrical arc in the middle half of the body. Uterus voluminous, occupying the middle half of the body. Eggs numerous, yellow to light brown, 23 to 26 by 17 to 18 μ . Excretory vesicle a simple short sac opening into the genital sinus. Habitat: Pyloric ceca and intestine of Leptocephalus myriaster (Brevort). Locality: Takamatsu, Onomichi and Shimonoseki, Japan.

Yamaguti, 1934

13. *Prosorhynchus uniporus* Ozaki, 1924

According to Ozaki this species is distinguished from all other mem-

bers of the genus by the connection of the genital sinus with the excretory vesicle.¹⁾ In addition this worm is characterized by the disc-shaped rostellum which is structurally different from that of *P. crucibulum* (Rud.). On the basis of these characters I was able to identify its encysted larvae from the pectoral and abdominal fins of *Callionymus lunatus* Temm. et Schl.

The worm is oval, about 0.64×0.4 mm and thickly covered with minute spines all over. In the anterior part of the body the spines project beyond the surface, but posteriorly they are entirely imbedded in the cuticle. The anterior

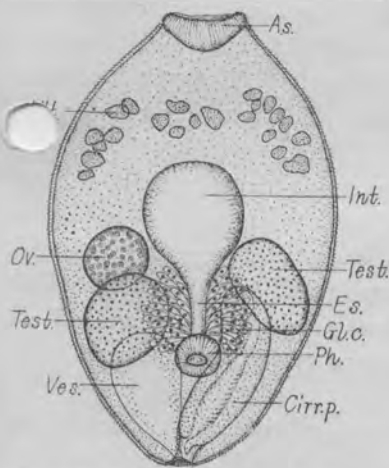


Fig. 12. Larva of *Prosorhynchus uniporus* Ozaki; ventral view.

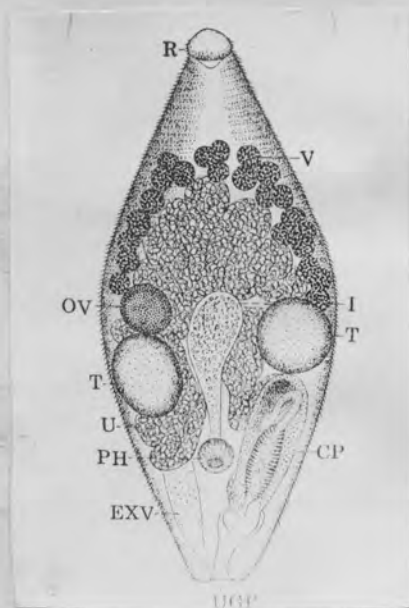
1) According to my observations the excretory vesicle opens very close to the genital pore at the posterior extremity of the body and no true "urogenital pore" such as described by Ozaki is present.

Prosorhynchus uniporus Ozaki, 1924

Body oval, 1.2-1.7 mm. long, 0.52-0.7 mm broad; anterior end pointed, posterior end truncate. Rhynchus at anterior end of the body, 0.1-0.12 mm long, 0.12-0.14 mm broad. Skin spinny. Pharynx at one quarter of body length from posterior end, 0.08-0.12 mm in diameter. Intestine a simple clavate sac extending to center of body. Testes two, one on either side of the intestine, globular to ovoid, about 0.2-0.3 mm in diameter. Ovary small, globular, 0.12-0.18 mm in diameter, closely in front of right testes. Cirrus pouch large, 0.34-0.5 mm long, 0.11-0.17 mm broad, at the posterior end of body. Vitelline follicles spherical, 0.035-0.05 mm in diameter, arranged in a symmetrical arc in the anterior half of the body. Uterus voluminous, occupying the middle half of the body. Eggs numerous, yellow to light brown, 0.023-0.026 mm by 0.017-0.018 mm. Excretory vesicle a short simple sac opening into the genital sinus.

Habitat: Pyloric appendages and intestine of Leptocephalus myriaster (Brevoort)

Locality: Takamatsu, Onomichi and Shimonoseki, Japan



This species seems to be just like P. aculeatus except that the genital atrium joins the excretory vesicle.

~~Other~~ gonads are in the triangular arrangement as in P. crucibulum & in P. aculeatus

I consider this species a synonym of P. ^{aculeatus} uniporus 1924.

19. *Prosorhynchus uniporus* Ozaki, 1924

(Fig. 19)

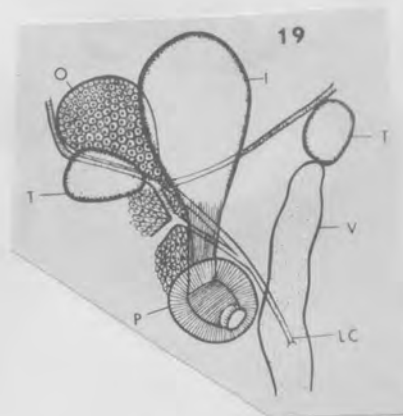
HABITAT: Small intestine of *Gymnothorax flavimarginatus*; Hawaii.

DESCRIPTION (based on ten whole mounts): Body elliptical to fusiform, spinose, 1.1-1.5 mm long by 0.27-0.52 mm wide. Rhynchus pad-like, muscular, with slight depression at apex, but not sucker-like, $50-110 \times 115-210 \mu$. Pharynx $70-110 \mu$ in transverse diameter, situated at or behind junction of middle with posterior third of body. Esophagus very short; intestine inverted retort-shaped, $0.18-0.27 \times 0.09-0.15$ mm, directed forward with its base in midregion of body.

Testes rounded, $60-120 \times 50-100 \mu$, situated symmetrically or asymmetrically one on each side of body in pharyngo-intestinal zone. Cirrus pouch subcylindrical, $130-260 \times 20-70 \mu$, largely in posterior third of body; seminal vesicle oval to cylindrical, $50-120 \times 20-70 \mu$; prostatic complex well developed. Genital atrium funnel-shaped, $60-120 \times 30-90 \mu$, opening ventrally $10-25 \mu$ anterior to terminal excretory pore (the specific name *uniporus* is not appropriate on this account).

Ovary round, $70-170 \times 70-110 \mu$, situated usually anterodorsal, anterolateral, or anteromedial to right testis; shell gland complex variable in position, sometimes immediately postovarian, sometimes nearer to right testis on its right side or posterior to it. Main bulk of uterus between rhynchus and intestine. Eggs oval, $25-30 \times 18-21 \mu$. Vitellaria consisting of over 20 follicles, forming an arc ventral to anterior uterine coils. Excretory vesicle reaching to level of pharynx or more anteriorly; pore terminal.

DISCUSSION: Although this species has been synonymized by Manter (1940) with *Prosorhynchus aculeatus* Odhner, 1905, our specimens from Hawaii agree better with Ozaki's description than with Odhner's. I still hold the opinion that *P. uniporus* is a valid species.



1. *Prosorhynchus* sp.

Host: *Chilomycterus schoepfi* (Walbaum), spiny boxfish, family Diodontidae.

Incidence of infection: In 1 of 3 hosts.

Location: Interradial membranes of all fins.

Locality: Cabbage Key, Boca Ciega Bay, Florida.

Immature *Prosorhynchus* sp. from the spiny boxfish were not saved. Caballero, Bravo and Grocott (1953) have reported taking immature *Prosorhynchus* from the kidney of *Polydactylus opercularis* (= *Polynemus opercularis*), a threadfin, from the Gulf of Panama. To our knowledge, this record of Caballero et al (1953) is the only published report of a natural infection of fishes by *Prosorhynchus* metacercariae in this continent. According to Hopkins (1954) other records of larval *Prosorhynchus* from fishes may have actually referred to species of other bucephalid genera.

FROM SOGANARES-BERNAL & HUTTON, 1959